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Farmer's Lung

A Summary of the Occupational Health Concern

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FARMER'S LUNG--A SUMMARY OF THE OCCUPATIONAL HEALTH CONCERN

This publication was prepared as a source of information for health and safety committees and others with an interest in understanding and reducing the occupational risk of Farmer's Lung.

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INTRODUCTION

Farmer's Lung is an allergic lung disease caused by breathing in dust from mouldy crops, especially mouldy hay. It is a specific disease and should not be confused with other kinds of lung diseases caused by other types of dust.

Sometimes Farmer's Lung can appear as a sudden illness with fever and shortness of breath that resembles pneumonia. More often, Farmer's Lung develops as a gradual disease that resembles a winter-time 'chest cold' that lasts for weeks or months.

If tolerated for months or years, Farmer's Lung can eventually cause permanent lung damage, disability and, in rare cases, even death.

To diagnose Farmer's Lung, it is extremely important for a physician to know if a patient with shortness of breath has been exposed to the dust of mouldy crops.

To prevent Farmer's Lung, steps must be taken to control spoilage bacteria and moulds on harvested crops. Where this is not effective, workers must avoid breathing in dust from mouldy crops.

There is no cure for Farmer's Lung. Workers with Farmer's Lung must cope with the disease by avoiding further contact with the dust that causes the allergy.

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1. WHAT IS FARMER'S LUNG?

Farmer's Lung is an allergic disease usually caused by breathing in the dust from mouldy hay. However, dust from any mouldy crop--straw, corn, silage, grain, or even tobacco--can also cause Farmer's Lung. The technical name for Farmer's Lung is "extrinsic allergic alveolitis" or "hypersensitivity alveolitis."

The disease causes shortness of breath and a feeling of general illness, either in a sudden attack or as a slow, progressive disease. When people with Farmer's Lung are able to avoid breathing in dust from mouldy crops or feed, they seldom have further problems. On the other hand, lengthy exposure can cause permanent lung damage, physical disability, or even death.

Usually, people with Farmer's Lung do not associate their health problem with exposure to mouldy hay: rather they go to their doctors complaining of breathing problems. It is important to recognize the danger of working with mouldy crops and to be able to recognize the signs and symptoms so Farmer's Lung can be dealt with before it becomes a serious illness.

2. WHAT IS THE CAUSE OF FARMER'S LUNG?

Farmer's Lung is caused by breathing in dust containing the spores of special, heat-tolerating bacteria or moulds often found on mouldy crops. Spores from two types of bacteria, "Micropolyspora faeni" and "Thermoactinomyces vulgaris," and certain types of moulds called "Aspergillus" are the major causes of Farmer's Lung.

In areas where crops are harvested in wet or rainy weather, crops usually undergo self-heating while in storage. When this happens, heat-tolerating bacteria and moulds grow rapidly and cause spoilage. As spoiled hay dries, it becomes darkened, easily crumbled and extremely dusty. This dust, which contains bacteria and mould spores is extremely fine. The spores can be breathed into the innermost regions of the lungs where the problem begins.

The spores that cause Farmer's Lung are not infectious. Instead, they trigger an allergic reaction.

Allergic reactions are produced by the immune system, the body's defence system that normally protects against infectious diseases. The immune system reacts when special substances called "antigens" enter the body. Antigens are usually found on germs such as infectious bacteria or viruses and the immune system reacts to neutralize these germs and prevent infections. Antigens are also found on harmless material such as mould spores. Sometimes the immune system will react against these by producing a harmful reaction against a harmless substance.

Farmer's Lung develops in two steps. The first time a person inhales a large amount of dust and spores from mouldy hay, the immune system often responds by producing specific antibodies against the antigens. Antibodies are chemicals that circulate in the blood and attack specific antigens. Once the body has produced these antibodies, there is a chance that further exposure to mouldy dust can generate a hypersensitive type of allergic reaction. This reaction is typical of Farmer's Lung.

A hypersensitive reaction is triggered when antigens in the lungs react with antibodies that circulate in the blood, setting off a complicated reaction normally intended to protect the lungs from infections. Certain types of white blood cells move into the lungs to attack the antigens. Then, other types of white blood cells move into the lungs, releasing chemicals and poisons that increase blood flow and kill lung tissue close to the antigens. This response causes swelling, inflammation and damage to lung tissue, resulting in noticeable breathing problems.

The effects of this type of reaction are delayed and become noticeable about 4 to 8 hours after dust has been inhaled into the lungs. The tissue damage in the lungs causes shortness of breath and the interaction between antigens and antibodies causes illness throughout the whole body. Occasionally, an intense hypersensitive reaction can lead to shock and, in rare cases, to death.

In the early stages of Farmer's Lung, people generally recover from attacks with only a small amount of lung damage. Further attacks can cause "fibrosis" or scar formation within the lungs. Once fibrosis starts, lung damage becomes permanent. The lungs shrink in size and shortness of breath becomes worse. In some cases, Farmer's Lung can be accompanied by asthma, another type of allergic lung disease.

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3. HOW COMMON IS FARMER'S LUNG?

There is little information on the exact number of people with Farmer's Lung in Canada. Studies show that incidence varies from place to place. The disease seems to occur in about 2 to 10 percent of farm workers, depending on the region. In some areas, blood tests have shown that 20 to 40 percent of farm workers have antibodies that react with antigens responsible for Farmer's Lung. This test indicates that people have had at least an initial exposure to mouldy dust.

The disease is most common in regions with wet weather at harvest time. Farmer's Lung is also more common on dairy farms, especially those not equipped with automated equipment for handling hay or feed. Attacks of Farmer's Lung occur most often in late winter or early spring when stored hay or grain is used to feed livestock.

4. WHO IS AT RISK OF DEVELOPING FARMER'S LUNG?

Farmer's Lung is a risk for adults who breathe dust from mouldy hay or other mouldy crops. For reasons not completely understood, children rarely develop Farmer's Lung.

The degree of risk depends on the amount of dust that has collected in the person's lungs. There is little danger working with loose hay in an open field but the risk increases when farmers or farm workers are breaking open bales of mouldy hay or straw inside closed barns or cowsheds. A person can inhale an extremely large amount of dust within a very short time while working indoors.

Other people exposed to dust from mouldy hay, straw or grain include grain handlers, stable employees, poultry workers, attendants of zoo and circus animals and pet shop workers. Studies also show that Farmer's Lung is a risk for city dwellers who visit stables, even occasionally.

5. HOW CAN YOU TELL IF YOU HAVE FARMER'S LUNG?

The signs and symptoms of Farmer's Lung vary tremendously. At one extreme, there are the symptoms associated with a sudden attack; at the other extreme, there are the symptoms associated with a slow progressive illness. The allergic response of the afflicted person depends on the sensitivity of the individual and the amount of mouldy dust entering the lungs.

There are three different types of allergic responses: acute or intense attack, sub-acute or low-level response, and chronic or long-term response.

Acute Farmer's Lung

Acute Farmer's Lung is easy to notice and occurs in about one in three cases. It starts as an intense attack about 4 to 8 hours after the person breathes in a large amount of dust from mouldy crops. These are some of the signs and symptoms:

- shortness of breath
- a dry irritating cough
- a sudden general feeling of sickness
- fever and chills
- a rapid heart rate
- rapid breathing

If the person avoids further exposure to mouldy dust, the signs and symptoms usually decrease after 12 hours, but they can last up to two weeks. Serious attacks can last as long as 12 weeks. The symptoms are sometimes confused with pneumonia.

Sub-acute Farmer's Lung

Sub-acute Farmer's Lung is more common than acute Farmer's Lung but it is less intense and more difficult to notice. It develops slowly, responding to continual exposure to small amounts of mouldy dust. The signs and symptoms include:

- coughing
- shortness of breath
- a mild fever and occasional chills
- a general feeling of sickness
- aches and pains in the muscles and joints
- a loss of appetite and loss of weight

People who are sensitive to dust from mouldy crops continue to exhibit these signs and symptoms as long as they are exposed to the dust. This condition sometimes resembles a 'chest cold' that lingers throughout the winter. Some people lose weight over several weeks.

Chronic Farmer's Lung

Chronic Farmer's Lung develops after several acute attacks over a period of years. It afflicts people who have been continually exposed to large amounts of mouldy dust. Sometimes, the illness lasts several months and is marked by

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increasing shortness of breath, an occasional mild fever, and often, a significant loss in weight and a general lack of energy. The symptoms are accompanied by permanent lung damage and gradually worsen as exposure to mouldy dust continues.

6. WHAT TESTS ARE AVAILABLE FOR FARMER'S LUNG?

There is no single, simple test to distinguish between Farmer's Lung and other types of lung diseases.

The most important evidence for Farmer's Lung is the history of exposure to dust from mouldy hay or other mouldy crops and the development of signs and symptoms 4 to 8 hours later. This is why it is so important for a doctor to know if a patient with shortness of breath has been exposed to mouldy crops.

A physician may request a number of tests including a) a lung x-ray, b) a blood test for antibodies, c) a pulmonary lavage test to examine the contents in a small area of the lungs, d) lung function tests to examine the amount of air flowing into the lungs and gas exchange from the lungs to the blood, e) a lung allergy challenge test to identify the specific cause of the allergic reaction, or, f) lung biopsy to examine lung tissue in more serious cases.

7. WHAT IS THE TREATMENT FOR FARMER'S LUNG?

For people suffering from acute attacks of Farmer's Lung, the first step in treatment is to avoid further contact with mouldy dust. For serious cases, bed rest is recommended and oxygen therapy may be needed to relieve shortness of breath.

Certain medications provide relief from an allergic response during acute attacks and make breathing easier. The long-term use of these drugs is not advisable since they can hide the symptoms of Farmer's Lung without preventing lung damage from re-exposure to mouldy dust.

No cure exists for people who become hypersensitive to mouldy dust. Once people become hypersensitive, they remain hypersensitive for years, perhaps for life.

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8. FARMER'S LUNG: PREVENTING IT

There is no simple method to prevent conditions that lead to Farmer's Lung. Steps must be taken to avoid crop spoilage and production of bacterial or mould spores that cause the allergic reaction. Workers must also take precautions to avoid breathing in spores from mouldy crops. The following measures are recommended:

- Wet hay, grain, or other crops can be dried at harvest. This is often an effective solution but it is seldom easy and usually expensive.
- If possible, hay with a high risk of spoilage should be stored in silage instead of bales.
- Buildings with large amounts of dusty material should be properly ventilated.
- Farm chores that involve handling hay or feed should be mechanized as much as possible to reduce exposure to mouldy dust.
- During cleaning of barns or stables, dust from mouldy crops should be wetted down before being swept to prevent it from becoming airborne.

Approved, properly fitted dust respirators (masks) may protect the lungs from spores of moulds or bacteria. These respirators are available from safety equipment retailers.

This equipment, however, is seldom viewed as an easy solution. Professional advice is required for selection of the proper mask and filter.

Individuals must also receive training on the proper use of the equipment and procedures for maintenance and repair. To be effective, the respirator should be worn on every occasion that farm dust is encountered.

Interested individuals should contact their local farm safety association or an occupational health and safety organization for further information.

In all cases, however, a key protective measure is to investigate any procedure that can reduce or completely prevent the growth of the heat-tolerant bacteria or moulds that create the unwanted dust.

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9. FARMER'S LUNG: COPING WITH IT

No simple solution exists for coping with Farmer's Lung once a person has the disease. In general, hypersensitive people must avoid breathing dust from mouldy crops.

Where the problem remains unsolved for long periods of time, hypersensitive people may actually have to consider leaving the dusty environment and changing their occupation to avoid slow, progressive, permanent lung damage.

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